(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
16 June 2005 (16.06.2005)

PCT

(10) International Publication Number
WO 2005/054283 A3

(51) International Patent Classification[7]: C12Q 1/37, C07K 14/415, G01N 33/573, 33/569

(21) International Application Number: PCT/EP2004/013555

(22) International Filing Date: 30 November 2004 (30.11.2004)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
03027637.2 2 December 2003 (02.12.2003) EP

(71) Applicant *(for all designated States except US)*: **BASF Aktiengesellschaft** [DE/DE]; 67056 Ludwigshafen (DE).

(72) Inventors; and
(75) Inventors/Applicants *(for US only)*: **EHRHARDT, Thomas** [DE/DE]; Maulbronner Hof 49, 67346 Speyer (DE). **REINDL, Andreas** [DE/DE]; Brunhildestr. 24, 68199 Mannheim (DE). **FREUND, Annette** [DE/DE]; Römerweg 17c, 67177 Limburgerhof (DE). **SCHMIDT, Ralf-Michael** [DE/DE]; Am Schlossgarten 9d, 67489 Kirrweiler (DE). **SONNEWALD, Uwe** [DE/DE]; Am Hange 6, 06484 Quedlinburg (DE). **STITT NIGEL, Marc** [DE/DE]; Grosse Weinmeisterstr. 22a, 14469 Potsdam (DE). **LEIN, Wolfgang** [DE/DE]; Geschwister-Scholl-Str. 95, 14471 Potsdam (DE). **BÖRNKE, Frederik** [DE/DE]; Am heiligen Brunnen 2, 06484 Quedlinburg (DE). **DEIST, Kirsten** [DE/DE]; Akazienweg 20, 06449 Westdorf (DE).

(74) Common Representative: **BASF Aktiengesellschaft**; 67056 Ludwigshafen (DE).

(81) Designated States *(unless otherwise indicated, for every kind of national protection available)*: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(84) Designated States *(unless otherwise indicated, for every kind of regional protection available)*: ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:
— *with international search report*
— *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments*

(88) Date of publication of the international search report: 1 September 2005

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: CLP-PROTEASE AS TARGET FOR HERBICIDES

(57) Abstract: The present invention relates to Clp-protease, which, when absent, brings about reduced growth and chlorotic leaves as target for herbicides. For this purpose, novel nucleic acid sequences encompassing SEQ ID NO:3, SEQ ID NO:11 and SEQ ID NO: 17 and functional equivalents of SEQ ID NO:3, SEQ ID NO:11 and SEQ ID NO: 17 are provided. Moreover, the present invention relates to the use of Clp-protease in a method for identifying compounds with herbicidal or growth-regulatory activity, and to the use of the compounds identified by this method as herbicides or growth regulators.

WO 2005/054283 A3

INTERNATIONAL SEARCH REPORT

International Application No
PCT/EP2004/013555

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 C12Q1/37 C07K14/415 G01N33/573 G01N33/569

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 C12Q C07K G01N

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)
EPO-Internal, BIOSIS, EMBL, PAJ, WPI Data, EMBASE, CHEM ABS Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	DATABASE EMBL 'Online! XP002279219 retrieved from EBI Database accession no. AB022327 sequence alignment abstract -& DATABASE UNIPROT 'Online! XP002281264 retrieved from EBI Database accession no. Q9XJ36 abstract -& NAKABAYASHI KAZUMI ET AL: "Identification of clp genes expressed in senescing Arabidopsis leaves" PLANT AND CELL PHYSIOLOGY, vol. 40, no. 5, May 1999 (1999-05), pages 504-514, XP009030466 ISSN: 0032-0781 ----- -/--	3-9,19, 20

[X] Further documents are listed in the continuation of box C.

[X] Patent family members are listed in annex.

° Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
30 May 2005	23/06/2005

Name and mailing address of the ISA	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Jacques, P

Form PCT/ISA/210 (second sheet) (January 2004)

INTERNATIONAL SEARCH REPORT

International Application No
PCT/EP2004/013555

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	DATABASE EMBL 'Online! XP002279220 retrieved from EBI Database accession no. AB022330 sequence alignment abstract -& DATABASE UNIPROT 'Online! XP002281265 retrieved from EBI Database accession no. Q9XJ35 abstract -& NAKABAYASHI KAZUMI ET AL: "Identification of clp genes expressed in senescing Arabidopsis leaves" PLANT AND CELL PHYSIOLOGY, vol. 40, no. 5, May 1999 (1999-05), pages 504-514, XP009030466	3-9,19, 20
X	DATABASE EMBL 'Online! XP002279221 retrieved from EBI Database accession no. AK118523 sequence alignment abstract -& DATABASE UNIPROT 'Online! XP002281266 retrieved from EBI Database accession no. Q9FN42 abstract -& KOTANI ET AL.: "Structural analysis of Arabidopsis thaliana chromosome 5.II. Sequence features of the regions...." DNA RES., vol. 4, 1997, pages 291-300, XP008017317	3-9,19, 20
X	WO 03/008440 A (PATTON DAVID ANDREW ;SYNGENTA PARTICIPATIONS AG (CH); ASHBY CARL S) 30 January 2003 (2003-01-30) table 5, gene 62837, sequences 81-82 and the whole document	1,2, 10-20
X	HEINE, HAROLD W. AND BROOKER, ANNE C.: "The isomerization of aziridine derivatives. VI. The rearrangement of some 2-(1-Aziridinyl)quinoxalines" JOURNAL OF ORGANIC CHEMISTRY, vol. 27, 1962, pages 2943-2944, XP002328507 p.2944, compound Ia.	26

-/--

INTERNATIONAL SEARCH REPORT

International Application No
PCT/EP2004/013555

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	DATABASE REGISTRY 'Online! 29 May 2001 (2001-05-29), XP002328508 retrieved from STN Database accession no. RN-338775-59-0 abstract	26
Y	HUANG C ET AL: "The Chlamydomonas chloroplast clpP gene contains translated large insertion sequences and is essential for cell growth." MOLECULAR & GENERAL GENETICS: MGG. GERMANY 25 JUL 1994, vol. 244, no. 2, 25 July 1994 (1994-07-25), pages 151-159, XP001181317 ISSN: 0026-8925 the whole document	1,2, 10-20
Y	SHIKANAI TOSHIHARU ET AL: "The chloroplast clpP gene, encoding a proteolytic subunit of ATP-dependent protease, is indispensable for chloroplast development in tobacco" PLANT AND CELL PHYSIOLOGY, vol. 42, no. 3, March 2001 (2001-03), pages 264-273, XP009030482 ISSN: 0032-0781 the whole document	1,2, 10-20
Y	CLARKE ADRIAN K ET AL: "Inactivation of the clpP1 gene for the proteolytic subunit of the ATP-dependent Clp protease in the cyanobacterium Synechococcus limits growth and light acclimation" PLANT MOLECULAR BIOLOGY, vol. 37, no. 5, July 1998 (1998-07), pages 791-801, XP009030486 ISSN: 0167-4412 the whole document	1,2, 10-20
A	ADAM ZACH ET AL: "Chloroplast and mitochondrial proteases in Arabidopsis. A proposed nomenclature" PLANT PHYSIOLOGY (ROCKVILLE), vol. 125, no. 4, April 2001 (2001-04), pages 1912-1918, XP002279218 ISSN: 0032-0889 p.1912, right-hand column, second paragraph and p. 1913, right-hand column, the "Clp proteases" section	1-20

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No
PCT/EP2004/013555

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 03008440 A	30-01-2003	WO 03008440 A2	30-01-2003